

Rebuild Hawaii Consortium Meeting
May 22, 2007
HEI Training Room, 8th floor
American Savings Bank Building, Alakea and S. King Streets
Honolulu, Hawaii

Notes

*You can find copies of these notes and presentations on the Internet at
<http://www.rebuildhawaii.us>*

Attendees are listed on the final page.

WELCOME AND INTRODUCTIONS

Eileen Yoshinaka, interim Vice President of the Rebuild Hawaii Consortium, welcomed the group and discussed the growth and successes of the consortium since she helped establish the organization in 1998. Eileen is the recently retired Pacific Liaison for the U.S. Department of Energy and is currently working as a volunteer with DBEDT's Energy Division.

Eileen introduced HECO employees Angelica Torres, who was coordinating the meeting's PowerPoint presentations, and Michael Chang, who has filled Jim Maskrey's position as Manager of HECO's Customer Efficiency Programs.

Eileen then introduced two new Business Affiliate members of the Consortium: Joseph Ting, 2006-2007 Chairman of the Hawaii Chapter of American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE); and Bill Short, an Officer and Director of BOMA Hawaii, an affiliate of the International Building Owners and Managers Association. Each of these gentlemen provided an introduction to their organizations.

PRESENTATIONS

Joseph Ting, Hawaii Chapter Chairman of ASHRAE: *How Can ASHRAE Help to Rebuild Hawaii?*

Joe described ASHRAE, a professional society with about 55,000 members in the heating, ventilation, air conditioning, and refrigeration profession, and their basic mission of advancing their profession through research, standards writing, publishing and continuing education. He described the organization's history, worldwide membership, and activities, emphasizing their focus on incorporating energy-efficient systems and equipment into the technical and educational information they produce. In discussing their vision for the future, Joe indicated ASHRAE's focus would be to provide the technology for better design, and the incorporation of sustainable design techniques.

Bill Short, BOMA Hawaii: *Introduction to BOMA*

Bill provided a brief overview of the Building Owners and Managers Association of Hawaii (BOMA – Hawaii), an affiliate of BOMA International, and introduced their association's current President, Dennis Gillum. Bill described BOMA as a key source of information on office building development, leasing, building operating costs, energy consumption patterns, local and national building codes, legislation, occupancy statistics and technological developments. He said that BOMA – Hawaii has recently initiated their "Hawaii Green

Program” to help incorporate energy efficiency and green building criteria into the organization’s activities. He closed his presentation by asking Rebuild Hawaii consortium members for assistance in identifying key issues they should include in this program.

Derek Sonoda, Hawaiian Electric Company, Program Manager, Energy Solutions for the Home: *HECO Residential and Commercial/Industrial Programs Overview*

Derek began his presentation by providing an overview of HECO’s recently enhanced energy efficiency rebate programs for businesses. The old rebate program had resulted in some \$18 million in rebates and incentives, and the new program adds several new technologies that now qualify for rebates. The new rebates are applied prescriptively to compact fluorescent lamps, super T8, T5, and T5 high output fluorescent lighting including cold cathode technology; LED exit signs; metal halide lights with pulse start; induction lighting; delamping without reflectors; window film, room (window) air-conditioners, packaged and split A/C systems, chillers, variable frequency drives, booster pumps, and electric motors. HECO’s custom rebate program for business has also been expanded.

Derek then described HECO’s new rebate programs for the home. These new rebates build on the existing solar water heating and high efficiency water heater programs by adding prescriptive rebates for installing EnergyStar appliances and ceiling fans, CFLs, and servicing central A/C systems. Derek also described HECO’s EnergyScout programs, which provide cash incentives to residential and business customers who are willing to curtail enlisted electrical loads during island-wide power emergencies.

Tom Van Liew, Energy Analyst, DBEDT, Strategic Industries Division: *Energy Star Certification*

Tom described U.S. EPA’s Energy Star program for buildings, and the five criteria that must be met to qualify a building for Energy Star certification. The five criteria are: 1) energy efficiency, based on a comparison with other buildings of similar type and size; 2) adequate ventilation; 3) thermal comfort, considering both indoor temperature and humidity; 4) adequate illumination; and 5) indoor air quality. Tom then presented a checklist he developed to use in auditing State of Hawaii buildings for Energy Star certification. The checklist details the activities necessary to address each of the qualification criteria. He also provided examples of the tools (camera, light meter, anemometer, ballast checker, humidity/temperature gauge, etc.) needed to conduct an audit. Tom discussed the use of the Energy Use Index (EUI) as a screening tool to identify buildings likely to qualify for Energy Star certification. The EUI is the ratio of a building’s annual electricity consumption (in kWh) to floor space (in square feet). He found that buildings with an EUI of less than approximately 18 are generally good candidates. Tom closed by describing the three State of Hawaii buildings that are Energy Star certified: the State Office Tower in downtown Honolulu, the Kapolei Office Building, and the Abner Paki Hale Courthouse in Kaneohe.

Brenda Lowrey, State of Hawaii Department of Education (DOE), Facilities Planner: *Analysis of Economic, Environmental, and Occupant Benefits of Sustainable Design and LEED Certification for K-12 Public Schools*

Brenda presented an update on the sustainable design and LEED certification analysis being conducted for the Department of Education with funding from DBEDT. The analysis consists of

four separate studies: 1) the economic and environmental benefits of sustainable design for new elementary schools; 2) a case study of the benefits resulting from LEED Silver design, construction, and certification of the Waipahu Elementary School cafeteria; 3) a theoretical case study that evaluates the retrofit of an existing non-air-conditioned classroom; and 4) the identification of recommended implementation strategies.

The first study concluded that the 2.5% added cost of sustainable design, construction, commissioning and LEED certification is more than offset by operational savings over the project life. The single most important strategy in achieving economic benefits was found to be daylighting, with building orientation, envelope and efficient A/C equipment being significant contributors. The Waipahu School cafeteria case study concluded that maximizing daylighting and passive ventilation achieved a number of occupant and environmental benefits. The study of retrofitting a non-air-conditioned classroom indicated that passive design solutions to achieve heat abatement would have limited success, and that installing A/C using variable refrigerant technology might be the most energy efficient solution. Potential implementation strategies identified include employing life cycle cost analysis, prioritizing architectural and technological design strategies and selecting consultants with demonstrated expertise in sustainable design, and establishing a process for monitoring DOE's energy and water consumption.

Eileen Yoshinaka

In announcing the mid-morning break, Eileen told the meeting attendees that the Hawaii Chapter of the U.S. Green Building Council is sponsoring a one-day workshop to prepare participants for the LEED Accreditation Exam. Workshop sessions will held on June 15 and June 16, and there is a \$175 registration fee.

Glenn Sato, Energy Coordinator, County of Kauai: *Report on the Results of the Pacific Missile Range Facility (PMRF) Combined Heat and Power (CHP) Feasibility Study*

The propose of this study was to evaluate the feasibility of using methane gas from the County of Kauai's Kekaha landfill to fuel a CHP plant at PMRF. In the initial phases of the study, the project engineers, SCS Energy, collected and analyzed gas samples from closed and active portions of the landfill. They found recoverable landfill gas (LFG) was suitable to support 1.6 MW of electrical generation for a projected 25 years.

Based on a review of PMRF's electrical power and thermal energy needs, six CHP facility alternatives were identified and evaluated based on life cycle energy cost, potential to reduce fossil fuel use, and quantity of renewable power generated. The alternative selected consists of a LFG collection and treatment system at the Kekaha landfill, a 3.9-mile gas transmission pipeline from the landfill to PMRF, and a new 1.64 MW LFG-fired CHP plant with appurtenant heat recovery equipment and an absorption chiller to be sited adjacent to the existing PMRF power plant. Electricity and chilled water distribution systems are also included in the preferred alternative. Estimated cost to build out this project is \$8.2 million, with a projected internal rate of return exceeding 25%. The project will generate an average of almost 12 million kWh of renewable energy per year over its twenty-year life. It will reduce diesel oil consumption on Kauai by almost 800,000 gallons per year, and significantly reduce the levels of methane currently released to the atmosphere from the landfill.

Glenn closed his presentation by stating that the first step in project development will be the resolution of respective roles that would be played by PMRF, Kauai County, and Kauai Island Utility Cooperative. The full project feasibility report can be found at: <http://www.hawaii.gov/dbedt/info/energy/publications/chp-kauai2007.pdf>

Allyn Lee, City and County of Honolulu (CCH), Department of Design and Construction: *Update on Results of CCH Energy Performance Contracting Projects*

Allyn said that energy performance contracting (EPC) work at the Fasi Municipal Building and the Police Department Headquarters was essentially complete. He described the energy conservation measures (ECMs) installed in the two buildings, which include lighting retrofits and central A/C plant upgrades in the Municipal Building; and lighting upgrades and HVAC system modernization in the Police Headquarters. Allyn also stated that they have deployed a personal computer power management system on 1,000 computers in the City's LAN, and are collecting data to determine the optimal energy-savings configuration for this system.

Cost for installing the ECMs on the two buildings was approximately \$7 million, net of HECO rebates. Projected energy cost savings are on the order of \$690,000, leading to a simple payback of 11.1 years. Allyn closed by describing what he saw as being the "keys" to successfully completing the EPC project. These include having a preliminary energy assessment conducted by HECO to define the scope of work and estimated budget, involving CCH personnel familiar with the EPC process, and having a project contractors experienced in working with the city.

Glenn Baker, Verdiem Corporation: *Computer Power Management Technology*

Glenn initiated his presentation by presenting data that demonstrates personal computers (PCs) and monitors are significant and growing consumers of electricity in the workplace. Based on typical operating conditions, each PC/monitor uses some 300-750 kWh annually. While PC/monitors are getting more energy efficient, especially with the use of CRT monitors, their energy use is still growing by approximately 4% a year.

Glenn described various solutions to reducing PC energy waste, and stated that power management software has been found to be the most effective and least intrusive. He went on to describe Verdiem's "Surveyor" software, which provides network level control over PC power settings. The Verdiem software has been installed on City and County of Honolulu computers (see above notes on Allyn Lee presentation), and Glenn stated that they were realizing some 100-150 kWh/year energy savings on each PC.

John Rei, Chief Operating Officer, Sopogy, Inc.: *High Temperature (Concentrated) Solar Power*

John discussed the issues of global warming and Hawaii's (and Oceania's) dependence on imported oil, and introduced Concentrated Solar Power (CSP) as a partial solution. CSP is a technology for concentrating solar energy, most commonly through the use of parabolic reflectors or similar devices. By more effectively converting solar energy to heat, CSP can be used to drive thermal power plants. There are currently approximately 350 MW of CSP electrical generation in the U.S.

John described Sopogy's proprietary CSP technology (called SopoNova 1.6), which was developed specifically for Hawaii's environment. He said their CSP units are optically maximized for high performance and designed to be manufactured using existing lighting equipment. Primary uses of the SopoNova units are for solar A/C or electricity generation, appropriate for about 150 kW to 10 MW power plants. John estimates that installed cost for a 350-500 kW generating unit would be approximately \$4-5 per watt. Sopogy has recently received financing through a \$10M revenue bond for the installation of SopoNova units in a demonstration project at NELHA on the Big Island.

Michael Dwyer, VRTX Technologies: *Non-Chemical Cooling Water Treatment and Energy Management*

Michael provided a brief overview of how water-cooling systems - including cooling towers and evaporative condensers - operate, and then discussed the need to treat the cooling water to control scale, corrosion and bacterial buildup. Typically, such water treatment is accomplished using chemicals, and represents about 2% of cooling system operational costs. In addition to being relatively costly, chemical treatment can represent a significant source of environmental contamination.

VRTX technology is a non-chemical cooling water treatment system that creates a cavitation effect in the cooling water flow. This converts scaling compounds from a solid to a colloidal state, which can be easily filtered from the circulating cooling water. The vacuum induced by the cavitation also strips corrosive dissolved gases and controls bacteria in the cooling water. Michael concluded by presenting an example of VRTX units to be installed in a Honolulu hotel cooling water system. A simple payback of 16 months is projected should system installation go forward.

James Thomas, Sea Gull Lighting: *Let Energy Star Light Your Way*

James is a sales representative for Sea Gull Lighting, a large manufacturer of energy-efficient lights and ceiling fans headquartered in Tehachapi, California. He began his presentation by explaining what Energy Star is and how products must be rigorously tested by an independent third party to become Energy Star qualified. He showed that the typical home, with 30 2-bulb light fixtures would save about \$650 a year in energy costs by utilizing Energy Star as oppose to incandescent lighting.

Sea Gull Lighting makes Energy Star qualified CFLs and lighted ceiling fans for numerous applications. He summarized California's Title 24 requirements for indoor and outdoor lighting, and discussed new lighting technologies under development by his firm. These new technologies include dimmable CFL's, for which there is a large demand; xenon long life lamps, which are especially suitable for challenging installations; and light emitting diodes (LEDs), which are currently too expensive for wide application.

Eileen Yoshinaka

Eileen closed the meeting, reminding the attendees of the next Consortium meeting on August 21, 2007.

The Rebuild Hawaii Consortium shares information about new products, practices and services, but does not promote or endorse products or vendors.

Attendees

Actus Lend Lease—Jesse Tano
Air Reps Hawaii—Lisa Duhaylonsod, Brian Nakamura
Amel Technologies—Briar Schumacher
Am-Pres Corporation—Bill Short
ASHRAE—Joseph Ting
Bank of Hawaii—Jay Kwak, Questin Yamamoto
BOMA Hawaii—Dennis Gillum, Bill Short
Building Industry Association of Hawaii—Rayna Medina
Centex Destination Properties Hawaii—Brent Pike
Central Pacific Bank—Garret Takata
City & County of Honolulu--Allyn Lee, Ronald Tanaka
County of Kauai—Glenn Sato
Department of Accounting and General Services—Maurice Balderama
Department of Business, Economic Development & Tourism (DBEDT)--Carilyn Shon, Liz Raman,
Tom Van Liew, Karen Shishido
Department of Education—Brenda Lowrey, Sak Elliot, Bill Denham
Eco-Lite—Tom Brennan
Energy Management Group—Richard Figliuzzi
Energy Policy Forum—Michael Hamnett
Grainger, Inc.—Kevin Vegas
Hawaii Health Systems Corporation—Ron Kurasaki
Hawaii Pacific University—Stephen Allen
Hawaii State Department of Health—Ellen Schulte
Hawaii State Library System—Keith Fujio
Hawaiian Electric Company, Inc. (HECO) —Michael Chang, Derek Sonoda, Corrine Chang, Steve
Luckett, Milton Fujioka, Wade Shimoda, Darlene Bajadali, Angelica Torres, Dragos Opreescu,
Candace Oyasato
HIS Mechanical—Fred Moore
Honolulu Board of Water Supply—Carolyn Sawai
Island Pacific Academy—Hartson Doak
Johnson Controls, Inc.—Tommy Soder
Kauai Island Utility Cooperative—Steven Rymsha
Seagull Lighting—James Thomas
Sopogy—John Rei
SunTech—Stuart Scott
Tetra Tech, Inc.--Frank Kingery
Tower Engineering Hawaii—Tracy Taoka
U.S. Air Force—Michael Savena
U.S. Marine Corps-- John Dunbar
U.S. Navy, NAVFACHAWAII—Greg Gebhart
University of Hawaii Community Colleges—Rodney Yim
University of Hawaii at Manoa School of Travel Industry Management—Russell Uyeno
VERDIEM—Glenn Baker
VRTX Technologies—Michael Dwyer
Eileen Yoshinaka